



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/042,829	01/08/2002	Chi Wah Cheng	P/4076-10	7316

2352 7590 07/14/2003

OSTROLENK FABER GERB & SOFFEN  
1180 AVENUE OF THE AMERICAS  
NEW YORK, NY 100368403

EXAMINER

STONER, KILEY SHAWN

ART UNIT	PAPER NUMBER
----------	--------------

1725

DATE MAILED: 07/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/042,829

Applicant(s)

CHENG ET AL.

Examiner

Kiley Stoner

Art Unit

1725

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 June 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 25-49 is/are pending in the application.
- 4a) Of the above claim(s) 25 and 38-49 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 26-37 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 25-49 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 April 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)                      4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)                      5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.                      6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election with traverse of Group I (claims 1-12 and 24) in Paper No. 9 is acknowledged. The traversal is on the ground(s) that inventions I and II are neither independent or distinct, and should not be covered by separate patents. This is not found persuasive because the applicant points out section 806.04 of the MPEP, which gives an example of when apparatus and process claims are independent (i.e., unrelated). The restriction was not based on Groups I and II being unrelated, so this MPEP citation is improper. The correct citation is 806.05 (e), which is drawn to process and apparatus, wherein the apparatus as claimed can be used to practice another and materially different process, like preplacing polymer balls or steel studs. This restriction is proper under 806.05 (e). The applicant also argues that the materials being worked (intended use) are generally not treated as imparting patentability to apparatus claims which is correct, however, the material being worked on in the method claims does impart patentability which makes the claims restrictable. Both the apparatus and method claims have separate and distinct searches.

The requirement is still deemed proper and is therefore made FINAL.

### ***Drawings***

Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction

Art Unit: 1725

or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

Claims 26-37 are objected to because of the following informalities: Claim 21 contains a guide member. When referring to the applicant's specification the only guide member that is discussed is the linear guide 20, however, this linear guide member contradicts claim 21 and makes no sense, especially regarding the limitations of movable container. The Examiner has considered the guide member of claim 21 the template (14) and apertures (15) a.k.a. positioning means in claims 28 and 32. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 26-37 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 26-37 are indefinite because it is unclear whether the "guide member" of claim 21 is the "linear guide 20" or the "template 14 and apertures 15", which makes more sense to the Examiner.

Claim 27 recites the limitation "the biassing means" in line 1. There is insufficient antecedent basis for this limitation in the claim. "biassing" is also misspelled, please correct.

In claim 28, line 3 please change "older" to --solder--.

Claim 32 recites the limitation "the positioning means" in line 1. There is insufficient antecedent basis for this limitation in the claim.

In claim 34, line 1 please change "mans" to --means--.

Claim 37 recites the limitation "the positioning means" in line 2. There is insufficient antecedent basis for this limitation in the claim.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 26-29 and 32-35 are rejected under 35 U.S.C. 102(e) as being anticipated by Ooroku et al. (6,413,850 B1). The intended use of the instantly claimed apparatus is noted, however, the intended use does not patentably distinguish said claimed apparatus over the prior art.

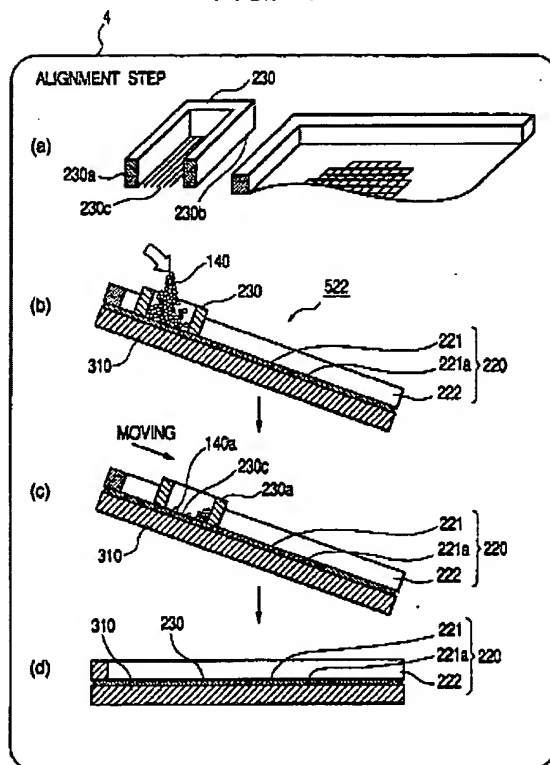
Ooroku et al. teaches a guide member which is configured to direct the solder balls to positions corresponding to the array of positions the solder balls are to take up on the substrate (Figures 4-6, specifically #220, 221, 221a and 222); a container for a plurality of solder balls, the container being movable between a first position remote from the guide member and a second positioned directly in communication with the guide member (Figures 4-6, specifically #230); a mechanism configured to apply a force to the solder balls in the container in the direction of movement of the container as the container moves between the first position to the second position (Figures 4-6). On page 4, lines 5-9 and page 7, lines 1-19 of the specification the applicant uses a gravitational force and the force generated by the walls of the container during movement to bias the solder balls in the direction of movement of the container. The mechanism that Ooroku et al. uses to move the container #230 applies force to the solder balls through both gravity and the side walls of the container #230.

Figure 4 also teaches tilting means adapted to rotate the container about an axis perpendicular to the direction of motion of the container to thereby tilt it. The mechanism used to tilt the container of Ooroku et al. is capable of rotating the container and the positioning means a plurality of times when the container is in position directly over the positioning means.

In addition Ooroku et al. teaches the rotational angles of the container and/or the moving speed of the container are controllable to optimize efficiency (column 9, lines 33-38 and column 10, lines 47-65); the positioning means includes a ball template with a plurality of apertures each slightly larger than the size of a solder ball in order to

Art Unit: 1725

capture solder balls with in the template, and wherein the plurality of apertures are arranged in an order similar to the array positions comprising solder pads on the substrate; solder balls captured in the plurality of apertures are removable by a pick-and-place device while retaining their respective positions, and places onto corresponding positions of solder pads on the substrate; means to rotate the container, ball template and substrate simultaneously; the apertures comprises through-holes which allow solder balls to fall through the ball template directly onto a substrate placed below it (Figures 4-6).

**FIG. 4**

Kasai et al. teaches a guide member which is configured to direct the solder balls to positions corresponding to the array of positions the solder balls are to take up on the



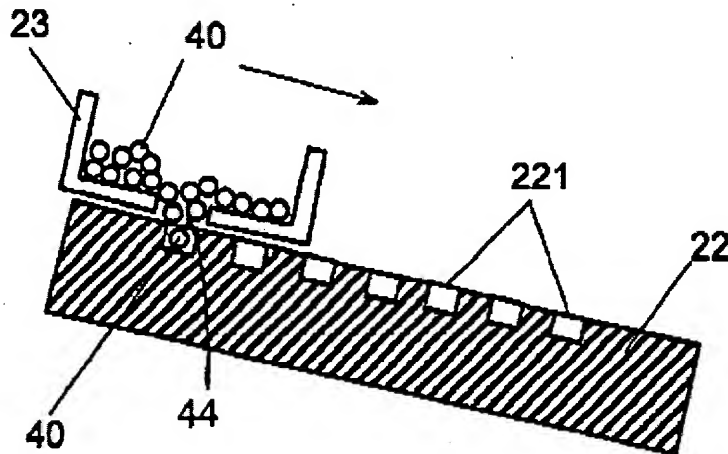
Art Unit: 1725

substrate (Figure 9, specifically #22); a container for a plurality of solder balls, the container being movable between a first position remote from the guide member and a second positioned directly in communication with the guide member (Figure 9, specifically #23); a mechanism configured to apply a force to the solder balls in the container in the direction of movement of the container as the container moves between the first position to the second position (Figure 9). On page 4, lines 5-9 and page 7, lines 1-19 of the specification the applicant uses a gravitational force and the force generated by the walls of the container during movement to bias the solder balls in the direction of movement of the container. The mechanism that Kasai et al. uses to move the container #23 applies force to the solder balls through both gravity and the side walls of the container #23. Figure 9 also teaches tilting means adapted to rotate the container about an axis perpendicular to the direction of motion of the container to thereby tilt it. The mechanism used to tilt the container of Kasai et al. is capable of rotating the container and the positioning means a plurality of times when the container is in position directly over the positioning means.

In addition Kasai et al. teaches the rotational angles of the container and/or the moving speed of the container are controllable to optimize efficiency (column 5, lines 35-46); a guide rail and motor whereby the motion of the container is guided and driven (column 4, lines 3-9 and column 5, lines 35-46); a vibration-generating device to facilitate the separation of solder balls from surfaces they are in contact with and/or from one another (column 5, lines 21-27); the positioning means includes a ball template with a plurality of apertures each slightly larger than the size of a solder ball in order to

Art Unit: 1725

capture solder balls within the template, and wherein the plurality of apertures are arranged in an order similar to the array positions comprising solder pads on the substrate; solder balls captured in the plurality of apertures are removable by a pick-and-place device while retaining their respective positions, and places onto corresponding positions of solder pads on the substrate; means to rotate the container, ball template and substrate simultaneously; the apertures comprises through-holes which allow solder balls to fall through the ball template directly onto a substrate placed below it (Figures 6A-B and 9).

**FIG. 9*****Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 1725

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ooroku et al. (6,413,850 B1) or Kasai et al. (6,390,351 B1) as applied to claim 26 above, and further in view of Fjelstad (6,253,992 B1). Ooroku et al. or Kasai et al. teach all of the limitations of the claims except the container is closed at the top to reduce oxidation of the solder balls and open at the bottom for direct entry of the balls to the positioning means.

Fjelstad teaches the container is closed at the top to reduce oxidation of the solder balls and open at the bottom for direct entry of the balls to the positioning means (Figure 2 and column 6, lines 6-7).

At the time of the invention it would have been obvious to combine the lid of Fjelstad with the container of Ooroku et al. or Kasai et al. in order to hold the solder balls in the container.

### ***Allowable Subject Matter***

Claim 36 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowance: The prior art of record does not teach or suggest either alone or in combination an apparatus for positioning solder balls as recited by claim 36, particularly the separator capable of

Art Unit: 1725

separating the ball template from the substrate in use, and the separator is movable from the first position where passage of solder balls from the ball template onto the substrate is prevented and the second position where passage of the solder balls from the ball template onto the substrate is permitted.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Conclusion***

The prior art of record that is cited as of interest is presented on the form-892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kiley Stoner whose telephone number is (703) 305-0723. The examiner can normally be reached on Monday-Thursday (7:30 a.m. to 6:00 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on Monday-Friday. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Kiley Stoner A.U. 1725  
Kiley Stoner 7-8-03